

Title:	STEM	Subject/Course:	Engineering Design & Development		
Topic:	The Problem	Grade (s):	9-12	Designer (s)	STEM C

Stage 1: Desired Results

Core Standard(s):

EDD.1.1 Examine current state of a problem

Understandings: Students will understand that....

Each problem has several dimensions (relative importance, history, complexity, etc.)

Many times problems are dynamic, changing continuously over time.

Essential Question(s):

What is the significance of this problem is it worthy of intellectual effort?

What are the cause(s) of this problem, principle and subordinate?

Does it appear possible to resolve this problem, and what resources are able to do so?

Students will know....

Student will be able to ...

The definition of Technology.
 The difference between human needs and wants.
 The definition of the “Designed World”.

Explain how math and science relate to product development.
 Describe how human needs and wants affect product development.

Stage 2: Assessment Evidence

What evidence will show that students understand?

Performance Task	X	Project	X	Quizzes
Tests	X	Informal Observations	X	Discussions
Interviews		Self-Assessment		Other

Stage 3: Learning Plan

Motivation – Introduce and Explain

How will you help students know *where* they are headed and why? How will you *hook* students through engaging and thought-provoking experiences that point toward big ideas, essential questions, and performance tasks?

Guide the students toward a problem of their choosing. Impart the students with ownership.

Assignment –

Write a clear statement defining the problem.

Model (Teacher presentation):

What instruction is needed to *equip* students for final performance?

Provide students with some examples of serious problems that may have existed in their school or their community, and the process that was used to solve these problems. Show examples of problems that were solved simply. Encourage the students to identify their own problem.

Guided and Independent Practice (Student Engagement):

What events can students *experience* to make the ideas and issues real? What learning activities will help student to *explore* the big ideas and essential questions?

Discussion – Find a problem(s) we could work on. Direct the students toward a problem that has personal relevance that is “real” to them.

Activity – Each student will create a prioritized list of potential problems that they would like to work on.

Reflection/Assessment:

How will you cause students to *reflect* and *rethink* to dig deeper into core ideas? How will you guide students in *rehearsing*, *revising*, and *refining* their work based on feedback and self-assessment? How will students *exhibit* their understanding about their final performances and products? How will you guide them in *self-evaluation* to identify the strengths and weaknesses in their work and set future goals?

Discussion – Review the prioritized problem lists that were developed by the individual students. Have each student review the list and explain to the class what they had in mind when they defined the problem as relevant. Ask the other students to react to the individual problems.

Activity – Create a “master list” of 2 – 5 problems, extracting the most relevant problems from the

discussion.
